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6.2 Overview of 80386 Protection Mechanisms

Protection in the 80386 has five aspects:

1. Type checking
2. Limit checking
3. Restriction of addressable domain
4. Restriction of procedure entry points
5. Restriction of instruction set

The protection hardware of the 80386 is an integral part of the memory management hardware. Protection applies both to segment translation and to page translation.

Each reference to memory is checked by the hardware to verify that it satisfies the protection criteria. All these checks are made before the memory cycle is started; any violation prevents that cycle from starting and results in an exception. Since the checks are performed concurrently with address formation, there is no performance penalty.

Invalid attempts to access memory result in an exception. Refer to [Chapter 9](#) for an explanation of the exception mechanism. The present chapter defines the protection violations that lead to exceptions.

The concept of "privilege" is central to several aspects of protection (numbers 3, 4, and 5 in the preceding list). Applied to procedures, privilege is the degree to which the procedure can be trusted not to make a mistake that might affect other procedures or data. Applied to data, privilege is the degree of protection that a data structure should have from less trusted procedures.

The concept of privilege applies both to segment protection and to page protection.

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